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SCIENTIFIC BOOKS.

A Synopsis of the Mammals of North America and the Adjacent Seas. By DANIEL GIRAUD ELIOT. Publications of the Field Columbian Museum, Zoological Series, Vol. II. Chicago, Field Columbian Museum; New York City, F. P. Harper; London, R. H. Porter; Berlin, R. Friedländer & Son; Paris, J. B. Bailliere & Son. March, 1901. Pp. xv + 471. Pls. XLIX. Text figs. 94. Price, \$3.00.

Until the appearance of Mr. Elliot's synopsis, no general work on the mammals of North America had been written since 1857, the date of publication by Baird of the eighth volume of the Pacific Railroad Survey reports. The need for a work of this kind may be appreciated from the fact that the number of mammals known to inhabit America north of Mexico has increased, during the past forty-four years, from about 300 to over 1,000.

"This Synopsis," the author writes, "is an attempt to bring together all the forms of North American * mammals that have been described, and which are generally considered as entitled to some kind of recognition. * * * The present time cannot be supposed as opportune for a final and satisfactory revision of the various groups * * *. That must be the work of some future Mammalogist, who can bring to the task not only a thoroughly unprejudiced mind, but who may have acquired a more intimate acquaintance with the quadrupeds of those sections of our country, as yet little known, and whose knowledge of geographical distribution of mammals, the extent of the individual variation of crania, the relationships that apparently different forms have for each other, and the changes in color assumed by the pelage throughout the year, and in some cases adopted by the sexes, has been gained from extensive series of specimens, much greater and more complete than those possessed by any naturalist at the present day. * * * This Synopsis, therefore, may only be regarded as a starting-point upon which such a final list may be founded, and does not purport to indicate how many species of mammals there are in North America, but merely to

* Or, more correctly, species inhabiting the United States and Canada, since those confined to other parts of the continent are omitted.

show how many forms are given some kind of distinctive rank at the present time * * *." Obviously the work is intended as a reflection of current opinion, and not as a critical treatment of the subject. Therefore it will be necessary, in order to appreciate the book, to gain some understanding of the tendencies of the more recent work on North American mammals, and also of Mr. Elliot's attitude toward the conclusions that he wishes to summarize.

The object of systematic biology was defined by Cope as the accurate statement of the results of organic evolution. Convenience in naming and labeling individual specimens is no longer to be regarded as of more than secondary importance. During the past fifteen years, the period of greatest activity in the study of North American mammals, series of specimens aggregating many thousands of individuals have been collected with the special object of showing the results attained by the process of evolution at the present time. These results, though not yet thoroughly understood, have been found much more complex than had been supposed. Species and subspecies, to use for the present these obsolete terms in the absence of the single word needed to replace them, are not invariably separated from their allies by characters easy to describe. They are interrelated with every degree of intricacy, and it is through the study of the more closely allied forms that the most significant facts are to be discovered. Sharply defined species have lost their history and with it their chief interest. No systematic work, therefore, is more important than the record of minute differences; and such difficulties as are met arise from the nature of the results which the process of evolution has reached, and from the inadequacy of language to express all that can be detected by the eye. That these difficulties are not averted when ignored is the standpoint of those with whose work Mr. Elliot deals. His attitude toward it may be learned from the second paragraph of the preface:

"It is very manifest to many Naturalists that too many forms have been given distinctive rank, and without doubt a considerable number of the so-called species and subspecies contained in this volume will eventually swell the

list of synonyms, already sufficiently formidable. In late years there has been an evident inclination among some Mammalogists to unduly magnify, as it would seem, trivial dissimilarities observed among their specimens, and thus greatly increase the number of slightly differentiated individuals elevated to a separate rank, at the risk of reducing the science to one founded on labels and localities, instead of distinctive and prominent characters, and thus a knowledge of the place where an example was obtained becomes at times of more importance for its identification than are the differences that may separate it from its allies. The lack of resemblances often observed among crania is frequently but the individual variations of a type, and taking these for characters upon which to establish a new species is apt to lead to error, and in not a few instances too much reliance has been placed on such slight differences. The same may be said of shades of color, and not a few names in this Synopsis have been given to specimens so closely alike, that one author, in speaking of his key, which was intended to be the means for distinguishing the species, has been obliged to say: *It will be necessary to have both skins and skulls in hand, and even then it will be impossible to identify some of the forms without actual comparison with their nearest allies.* The scientific value of such species (?) can only be very questionable at the best, and the elevation to a separate distinctive rank of such intimately related creatures cannot be considered as helpful or beneficial to Mammalogical Science. It can be safely asserted that there is hardly a genus of North American Mammals that does not contain too many named forms, and that the science would be benefited if a considerable number were relegated to their proper place among the synonyms."

No more would be required to show that the author is not in sympathy with the tendency toward minute accuracy characteristic of the work of to-day; but this hostile attitude is so insistently brought before the reader that one more allusion to it may be made. At the end of the account of the prairie wolves, rendered exceedingly obscure by the omission of details concerning skulls and teeth (pp. 301-303) occurs the following footnote: "It is difficult to dis-

tinguish these varieties of the coyote by any description, and still more so by the skins or skulls."

It is to be regretted that an author who is admittedly unable to present his own views throughout, and who is so obviously at variance with the opinions of others, should not have been content with bringing together as impersonally as possible the multitudinous scattered papers that now make the literature of the subject a maze. In the work as it stands, personal opinion, confessedly defective, and compilation, often not free from bias, are so blended that neither is convincing; and considerable knowledge on the part of the reader is required to avoid misunderstanding.

The book is well printed, though on glazed paper that is probably ill adapted to withstand constant use. This, however, was rendered necessary by the profuse half-tone figures with which the text is illustrated. Throughout the work a tendency to abbreviation is manifested, which, while it may have curtailed the length of the volume by a few dozen pages, has not increased the usefulness of the book. The time saved to author and printer by the use of such references as Schleg. Abte. Geb., or S. S. S. does not compensate the reader for that lost in search for the meaning so effectually concealed. Probably the feature of the work which will most forcibly impress those by whom it is most needed, and that which may be said to be its great defect, is the absence of keys. Of these there are none, either to species, genera or higher groups. The diagnoses of the 10 orders, 34 families, 115 genera and 998 species and subspecies occupy about one-third of a page each. In those relating to species and subspecies there is a noticeable lack of detail concerning skulls and teeth; while the characters given are often compiled in such a manner as to be misleading. The classification is essentially that of Trouessart, with the order reversed to begin with the marsupials. Species and subspecies are arranged in accordance with their supposed affinities, and, as might have been anticipated, the result is frequently less satisfactory than a purely alphabetic sequence would have been. No allusion is made to habits or life histories, and no English names are used except in the table

of contents. The technical nomenclature departs little from accepted usage, though it may be noted that the name *Cabassous* McMurtrie, 1831, is substituted for *Tatu* Blumenbach, 1799, *Manatus* Storr, 1780, for *Trichechus* Linnæus, 1758 (as applied to the manatee), and *Dicotyles* Cuvier, 1817, for *Tayassu* Fischer, 1814. The name *Trichechus*, though based on the manatee alone, is applied to the walrus. *Aplodontia* is altered to *Haplodontia* to conform with rules irrelevant to nomenclature, but *Reithrodontomys*, *Cynomys*, *tridecemlineatus* and doubtless many others, which on the same ground might be changed, are left in their correct original form. A single new name is proposed, *Balænoptera velifera copei* (page 13). As if to compensate for the brevity of the text, the book is illustrated with a profuseness hitherto unknown in similar works. The plates and text figures contain half-tone reproductions of photographs of the skull and teeth of at least one representative of nearly every genus and subgenus. The standard of excellence of these figures is very high, and no equally successful application of photography to zoological illustration on so extensive a scale has hitherto been made.

GERRIT S. MILLER, JR.

THE MARYLAND EOCENE BOOK.

THOSE who have had to deal with official geologic surveys know how frequently it is argued that publications of a character so purely scientific as paleontology appeal to a very limited audience, too limited, it is often urged, to justify the expenditure necessary for their proper production. The counter-argument, however, gets at the facts. Toward the close of the Second Geological Survey of Pennsylvania, after a cloud of volumes upon tectonics, economics and devitalized stratigraphy had been issued, Dr. Lesley prepared a 'Dictionary of Fossils,' profusely illustrated, suffused with important facts, amusing fancies and pages of errata, but a work of great usefulness. The demand created by the appearance of this book was so much greater than the supply that the edition was gone while its reportorial predecessors were resting on the shelves waiting for inquirers. In New York, Ohio and Illinois the experience has been very much the same.

'Maryland Geological Survey: Eocene' is the title of the first of a series of monographs upon the historical geology of Maryland, that is to say, its stratigraphy and fossils, in other words its paleontology. It seems eminently appropriate that the Eocene is chosen as the subject for the initial volume of this series in view of Professor Clark's exhaustive acquaintance with this formation. The state geologist, though taking a leading part in the composition and execution of the work has brought into cooperation with himself a number of experts in various special lines of research. Thus the leading chapter on Eocene stratigraphy and sequence, 'The Eocene Deposits of Maryland,' is by W. B. Clark and G. C. Martin. Under the part assigned to descriptive paleontology the chapters are as follows: Reptilia, by Case; Pisces, by Eastman; Arthropoda, and Bryozoa, by Ulrich; Mollusca, Brachiopoda and Echinodermata, by Clark and Martin; Coelenterata, by Vaughan; Protozoa, by Bagge, and Plantæ, by Hollick. Ten plates of maps and half-tones illustrate the first part of the work, and fifty-four process plates, largely of McConnell's fine pen-and-ink drawings, are devoted to the fossils. Like the other volumes of Professor Clark's survey this is exquisitely constructed on finished lines and commends itself to lovers of well-made books, who will all pray that the supercalendered wood-paper used for the plates may last until the world has no further need of the facts registered upon them.

It is an admirable achievement, bringing together in one place all that is now known of the Eocene stratigraphy and fauna in an important political division, and long after the present quarry workings, coal mines and clay pits of Maryland shall have been exhausted and abandoned, and all the economic products of the State shall have been converted into cash, the facts here brought together will endure, with a never-lessening value to the sum of human knowledge. The book will receive a welcome from paleontologists and merits the cordial appreciation of the citizens and students of the State for whom it has been specially prepared.

JOHN M. CLARKE.